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1 The measured performance of personal computer operating systems

J. B. Chen, Y. Endo, K. Chan, D. Mazieres, A. Dias, M. Seltzer, M. D. Smith

December 1995 **ACM SIGOPS Operating Systems Review , Proceedings of the fifteenth ACM symposium on Operating systems principles**, Volume 29 Issue 5

Full text available: pdf(1.98 MB) Additional Information: full citation, references, citings, index terms

2 The measured performance of personal computer operating systems

J. Bradley Chen, Yasuhiro Endo, Kee Chan, David Mazières, Antonio Dias, Margo Seltzer, Michael D. Smith

February 1996 **ACM Transactions on Computer Systems (TOCS)**, Volume 14 Issue 1

Full text available: pdf(2.38 MB) Additional Information: full citation, abstract, references, citings, index terms

This article presents a comparative study of the performance of three operating systems that run on the personal computer architecture derived form the IBM-PC. The operating systems, Windows for Workgroups, Windows NT, and NetBSD (a freely available variant of the UNIX operating system), cover a broad range of system functionality and user requirements, from a single-address-space model to full protection with preemptive multitasking. Our measurements are enable by hardware counters in Inte ...

Keywords: Microsoft Windows, operating systems performance measurement, operating systems structure, personal computers

3 Resource partitioning in general purpose operating systems: experimental results in Windows NT

D. G. Waddington, D. Hutchison

October 1999 **ACM SIGOPS Operating Systems Review**, Volume 33 Issue 4

Full text available: pdf(1.56 MB) Additional Information: full citation, abstract, index terms

The principal role of the operating system is that of resource management. Its task is to present a set of appropriate services to the applications and users it supports. Traditionally, general-purpose operating systems, including Windows NT, federate resource sharing in a fair manner, with the predominant goal of efficient resource utilisation. As a result the chosen scheduling algorithms are not suited to applications that have stringent Quality-of-Service (QoS) and resource management require ...

4 System support for automatic profiling and optimization

h c g e cf c

Xiaolan Zhang, Zheng Wang, Nicholas Gloy, J. Bradley Chen, Michael D. Smith
October 1997 **ACM SIGOPS Operating Systems Review , Proceedings of the sixteenth ACM symposium on Operating systems principles**, Volume 31 Issue 5
Full text available: pdf(1.95 MB) Additional Information: full citation, references, citings, index terms

5 Virtual machines: Scale and performance in the Denali isolation kernel
Andrew Whitaker, Marianne Shaw, Steven D. Gribble
December 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue SI
Full text available: pdf(1.91 MB) Additional Information: full citation, abstract, references, citings

This paper describes the Denali isolation kernel, an operating system architecture that safely multiplexes a large number of untrusted Internet services on shared hardware. Denali's goal is to allow new Internet services to be "pushed" into third party infrastructure, relieving Internet service authors from the burden of acquiring and maintaining physical infrastructure. Our isolation kernel exposes a virtual machine abstraction, but unlike conventional virtual machine monitors, Denali does not ...

6 Mobile file system support with virtual device drivers
Dorota M. Huizinga, Christine Ames
February 1999 **Proceedings of the 1999 ACM symposium on Applied computing**
Full text available: pdf(1.04 MB) Additional Information: full citation, references, index terms

Keywords: disconnected operation, file system extensibility, mobile computing, virtual device drivers

7 Features: Modern System Power Management
Andrew Grover
October 2003 **Queue**, Volume 1 Issue 7
Full text available: pdf(698.29 KB) html(24.20 KB) Additional Information: full citation, index terms

8 I/O: miNI: reducing network interface memory requirements with dynamic handle lookup
Reza Azimi, Angelos Bilas
June 2003 **Proceedings of the 17th annual international conference on Supercomputing**
Full text available: pdf(289.75 KB) Additional Information: full citation, abstract, references, index terms

Recent work in low-latency, high-bandwidth communication systems has resulted in building user--level Network Interface Controllers (NICs) and communication abstractions that support direct access from the NIC to applications virtual memory to avoid both data copies and operating system intervention. Such mechanisms require the ability to directly manipulate user--level communication buffers for delivering data and achieving protection. To provide such abilities, NICs must maintain appropriate t ...

Keywords: parallel architectures, system area networks

9 Router plugins: a software architecture for next-generation routers
Dan Decasper, Zubin Dittia, Guru Parulkar, Bernhard Plattner
February 2000 **IEEE/ACM Transactions on Networking (TON)**, Volume 8 Issue 1
Full text available: pdf(530.34 KB) Additional Information: full citation, references, citings, index terms

Keywords: communication system routing, communication system security, internet, modular computer systems

10 An efficient communication architecture for commodity supercomputers

Stephan Brauss, Martin Frey, Martin Heimlicher, Andreas Huber, Martin Lienhard, Patrick Müller, Martin Näf, Josef Nemecek, Roland Paul, Anton Gunzinger

January 1999 **Proceedings of the 1999 ACM/IEEE conference on Supercomputing (CDROM)**

Full text available: pdf(678.14 KB) Additional Information: full citation, references, index terms

11 Switcherland: a QoS communication architecture for workstation clusters

Hans Eberle, Erwin Oertli

April 1998 **ACM SIGARCH Computer Architecture News , Proceedings of the 25th annual international symposium on Computer architecture**, Volume 26 Issue 3

Full text available: pdf(1.32 MB) Publisher Site Additional Information: full citation, abstract, references, citings, index terms

Computer systems have become powerful enough to process continuous data streams such as video or animated graphics. While processing power and communication bandwidth of today's systems typically are sufficient, quality of service (QoS) guarantees as required for handling such data types cannot be provided by these systems in adequate ways.We present Switcherland, a scalable communication architecture based on crossbar switches that provides QoS guarantees for workstation clusters in the form of ...

12 A look at several memory management units, TLB-refill mechanisms, and page table organizations

Bruce L. Jacob, Trevor N. Mudge

October 1998 **Proceedings of the eighth international conference on Architectural support for programming languages and operating systems**, Volume 32 , 33 Issue 5 , 11

Full text available: pdf(1.90 MB) Additional Information: full citation, abstract, references, citings, index terms

Virtual memory is a staple in modem systems, though there is little agreement on how its functionality is to be implemented on either the hardware or software side of the interface. The myriad of design choices and incompatible hardware mechanisms suggests potential performance problems, especially since increasing numbers of systems (even embedded systems) are using memory management. A comparative study of the implementation choices in virtual memory should therefore aid system-level designers ...

13 Using network interface support to avoid asynchronous protocol processing in shared virtual memory systems

Angelos Bilas, Cheng Liao, Jaswinder Pal Singh

May 1999 **ACM SIGARCH Computer Architecture News , Proceedings of the 26th annual international symposium on Computer architecture**, Volume 27 Issue 2

Full text available: pdf(440.73 KB) Publisher Site Additional Information: full citation, abstract, references, citings, index terms

The performance of page-based software shared virtual memory (SVM) is still far from that achieved on hardware-coherent distributed shared memory (DSM) systems. The interrupt cost for asynchronous protocol processing has been found to be a key source of performance loss and complexity.This paper shows that by providing simple and general support for asynchronous message handling in a commodity network interface (NI), and by altering SVM protocols appropriately, protocol activity can be decoupled ...

14 Improving interactive performance using TIPME
Yasuhiro Endo, Margo Seltzer
June 2000 **ACM SIGMETRICS Performance Evaluation Review , Proceedings of the 2000 ACM SIGMETRICS international conference on Measurement and modeling of computer systems**, Volume 28 Issue 1

Full text available: pdf(1.05 MB) Additional Information: full citation, abstract, references, citings, index terms

On the vast majority of today's computers, the dominant form of computation is GUI-based user interaction. In such an environment, the user's perception is the final arbiter of performance. Human-factors research shows that a user's perception of performance is affected by unexpectedly long delays. However, most performance-tuning techniques currently rely on throughput-sensitive benchmarks. While these techniques improve the average performance of the system, they do littl ...

Keywords: interactive performance, monitoring

15 Alpha AXP architecture
Richard L. Sites
February 1993 **Communications of the ACM**, Volume 36 Issue 2

Full text available: pdf(4.62 MB) Additional Information: full citation, references, citings, index terms, review

Keywords: Alpha AXP chip

16 The interaction of architecture and operating system design
Thomas E. Anderson, Henry M. Levy, Brian N. Bershad, Edward D. Lazowska
April 1991 **Proceedings of the fourth international conference on Architectural support for programming languages and operating systems**, Volume 26 , 19 , 25 Issue 4 , 2 , Special Issue

Full text available: pdf(1.60 MB) Additional Information: full citation, references, citings, index terms

17 Disco: running commodity operating systems on scalable multiprocessors
Edouard Bugnion, Scott Devine, Kinshuk Govil, Mendel Rosenblum
November 1997 **ACM Transactions on Computer Systems (TOCS)**, Volume 15 Issue 4

Full text available: pdf(400.76 KB) Additional Information: full citation, abstract, references, citings, index terms, review

In this article we examine the problem of extending modern operating systems to run efficiently on large-scale shared-memory multiprocessors without a large implementation effort. Our approach brings back an idea popular in the 1970s: virtual machine monitors. We use virtual machines to run multiple commodity operating systems on a scalable multiprocessor. This solution addresses many of the challenges facing the system software for these machines. We demonstrate our approach with a prototy ...

Keywords: scalable multiprocessors, virtual machines

18 A closer look at coscheduling approaches for a network of workstations
Shailabh Nagar, Ajit Banerjee, Anand Sivasubramaniam, Chita R. Das
June 1999 **Proceedings of the eleventh annual ACM symposium on Parallel algorithms and architectures**

Full text available: pdf(1.38 MB) Additional Information: full citation, references, citings, index terms

19 Architecture-dependent operating system project sequence

John L. Donaldson

February 2001 **ACM SIGCSE Bulletin , Proceedings of the thirty-second SIGCSE technical symposium on Computer Science Education**, Volume 33 Issue 1

Full text available: pdf(142.42 KB) Additional Information: full citation, abstract, references, citings, index terms

Developing hands-on programming projects for a course on operating systems is a challenge. A wide variety of methods have been used and reported on at past SIGCSE meetings. A good summary of some of these projects can be found in [5]. One approach is to build a rudimentary operating system kernel from the bottom up. This approach necessarily involves some architecture-dependent coding. In this paper, the author describes his experience with such a project sequence based on the Intel protected mo ...

20 A study of initialization in Linux and OpenBSD

Catherine Dodge, Cynthia Irvine, Thuy Nguyen

April 2005 **ACM SIGOPS Operating Systems Review**, Volume 39 Issue 2

Full text available: pdf(2.02 MB) Additional Information: full citation, abstract, references

The code that initializes a system can be notoriously difficult to understand. In secure systems, initialization is critical for establishing a starting state that is secure. This paper explores two architectures used for bringing an operating system to its initial state, once the operating system gains control from the boot loader. Specifically, the ways in which the OpenBSD and Linux operating systems handle initialization are dissected.

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